Silicon Wafer EU TC Chapter
Meeting Summary and Minutes

ICM/Office Staffelsee
SEMICON Europa
November 16, 2023
09:00 AM – 11:00 AM CEST

TC Chapter Announcements

Next TC Chapter Meeting
November, 2024, Munich, Germany in conjunction with SEMICON Europa. Check www.semi.org/en/standards for the latest update.

Table 1 Meeting Attendees

Co-Chairs: Peter Wagner (Self)
SEMI Staff: Kevin Nguyen (SEMI HQ)

Company	*Last*	*First*	*Company*	*Last*	*First*
ASML	**Daware**	**Ajinkya**	**ASML**	**Planting**	**Bert**
Wooptix	**Gaudestad**	**Jan**	**Wolfspeed**	**Rao**	**Shailaja**
GlobalWafers	*Grabbe*	*Alexis*	**Siltronic**	**Riedel**	**Frank**
KLA	**Haller**	**Kurt**	**GlobalWafers**	**Sanna**	**Cristina**
Semilab	*Ivanenko*	*Alina*	*GlobalWafers*	*Takeda*	*Ryuji*
XFAB	*Liew*	*Emily*	**Self**	**Wagner**	**Peter**
Tokyo Electron	**Mashiro**	**Supika**	*Self*	*Yoshise*	*Masanori*
SUMCO	*Nakai*	*Tetsuya*			

Italic indicates remote participant. Bold indicates in-person participant.

Table 2 Leadership Changes

WG/TF/SC/TC Name	*Previous Leader*	*New Leader*
Int'l Test Methods TF	Peter Wagner (Self)	Thomas Hager (Siltronic)
Int'l Terminology TF	Peter Wagner (Self) (stepped down)	TBD

Table 3 Ballot Results

Document #	*Document Title*	*TC Chapter Action*
None		

#1 **Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.
#2 **Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting or abandoning.

Table 4 Ratification Ballot Results

Document #	*Document Title*	*ISC A&R Action*
None		

Table 5 Activities Approved by the GCS between meetings of the TC Chapter

#	*Type*	*SC/TF/WG*	*Details*
None			

Table 6 Authorized Activities

#	*Type*	*SC/TF/WG*	*Details*
7162	SNARF	Int'l Test Methods TF	New Standard: Test Method for epi-resistivity Determination in Si Wafers by Surface Charge Profiling
7163	SNARF	Int'l AWG TF	Reapproval of SEMI MF1530-0707 (Reapproved 1018): Test Method for Measuring Flatness, Thickness, and Total Thickness Variation on Silicon Wafers by Automated Noncontact Scanning

NOTE 1: SNARFs and TFOFs are available for review on the SEMI Web site at: http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF

Table 7 Authorized Ballots

#	*When*	*SC/TF/WG*	*Details*
7024	Cycle 9, 1 or 2, 3, 4-2024	Int'l Polished Wafer TF	Line Item Revision to SEMI M1-0918 Specification for Polished Single Crystal Silicon Wafers (Diameter tolerance for 300 mm wafers)
7163	Cycle 9, 1 or 2, 3, 4-2024	Int'l AWG TF	Reapproval of SEMI MF1530-0707 (Reapproved 1018) Test Method for Measuring Flatness, Thickness, and Total Thickness Variation on Silicon Wafers by Automated Noncontact Scanning

Table 8 SNARF(s) Granted a One-Year Extension

#	*TF*	*Title*	*Expiration Date*
None			

Table 9 SNARF(s) Abolished

#	*TF*	*Title*
None		

Table 10 Standard(s) to receive Inactive Status

Standard Designation	*Title*
None	

Table 11 New Action Items

Item #	*Assigned to*	*Details*
2023Nov-11	Ajinkya Daware (ASML), and Kevin Nguyen (SEMI staff)	To prepare revision of SEMI M1 (Subject: 300 mm wafer diameter changing tolerance ±200 um to ±100 um) ballot for adjudication at SEMICON West

Table 12 Previous Meeting Action Items

Item #	*Assigned to*	*Details*	*Status*
2022Nov-01	Paul Trio (SEMI Staff)	Work with SEMI Staff to assist in coordination of activities between Silicon Wafer and Compound Semiconductor Materials Technical Committees	Completed

1 Welcome, Reminders, and Introductions

1.1 Peter Wagner called the meeting to order at 9:00 AM. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

2 Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed the minutes of the previous meeting.

Motion:	Accept the minutes as written.
By / 2nd:	By: Kurt Haller / KLA Second: Bert Planting / ASML Netherlands BV
Discussion:	None
Vote:	9-0

3 Liaison Reports

3.1 *North America TC Chapter*

3.1.1 Kevin Nguyen reported. All activities were reported from the previous meeting in Spring 2023. A recap is available on these slides attached.

Attachment: NA Si Wafer TC Chapter Liaison Report July2023

3.2 *Japan TC Chapter*

3.2.1 Nakai-san reported for the Japan TC Chapter.

- Last meeting
  - August 25, 2023
- Next meeting
  - Thursday , December 14, 2023
  - Tokyo Big Sight (via OVTCCM) Hybrid in conjunction with SEMICON Japan 2023
- Ballot Result
  - None
- Japan Test Method Task Force
  - Ballot Development
    - 6702, Revision of M60 Test Method for Time Dependent Dielectric Breakdown Characteristics of SiO2 Films for Si Wafer Evaluation
    - 6687, Revision of M51 Test Method for Characterizing Silicon Wafer by Gate Oxide Integrity
- Ballot to be Reviewed:
  - 6570, New Standard: Guide for Measuring Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers by a Laser-Scatter Tomography Technique

Attachment: 202310_Silicon Wafer_JA_Liaison R0.1

4 SEMI Staff Report

4.1 Kevin Nguyen (SEMI) reported.

- SEMI upcoming event
    - Upcoming Meetings
        - SEMICON Japan
            - Dec 13-15
            - Tokyo, Japan
- 2023 & 2024 Critical Dates for SEMI Standards Ballots
    - https://www.semi.org/en/collaborate/standards/ballots
- New Online Ballot System
    - User Data Quality
        - Problem – User Data in SVM shows incorrect information
        - Cause – The SVM Login process has a separate User Database than the existing Online Ballot System and requires ongoing synchronization. Also affects https://connect.semi.org
        - Progress
            - Completed internal testing
            - Documentation and Training in development
        - Open Community Preview of the New Online Ballot System during Cycle 9, 2023
            - Committee Members to become familiar with new interface and provide feedback
        - Open New Online Ballot System for Live Ballot voting for Cycle 1, 2024
- SEMI Standards Publications
    - Total SEMI Standards in portfolio: 1,085
        - Includes 335 Inactive Standards

Attachment: Staff Report Nov 2023 v3

5 Ballot Review

5.1 None

6 Task Force Reports

6.1 *Int'l Advanced Wafer Geometry Task Force / F. Riedel/F. Passek*

6.1.1 Frank reported. Of note:

- 5 Year Review
    - SEMI M73-1013E (Reapproved 1019): Test Method for Extracting Relevant Characteristics from Measured Wafer Edge Profiles
    - SEMI MF1530-0707 (Reapproved 1018): Test Method for Measuring Flatness, Thickness, and Total Thickness Variation on Silicon Wafers by Automated Noncontact Scanning
        - **Motion:** Authorize the MF1530 for reapproval ballot for review at SEMICON West
          By: Frank Riedel / Siltronic AG
          Second: Maria Cristina Sanna / GlobalWafers Company
          Discussion:
          Result: 9-Y 0-N Voting Result: Pass - 100.00%.

- Ballot Development
    - Doc 6983 - Revision of SEMI M49-0918 With Title Change To: Guide for Specifying Geometry Measurement Systems for Silicon Wafers for the 130 nm to 3 nm Technology Generations
        - Yoshise-san presented a comprehensive overview of all rejects and comments on last ballot and resulting potential changes to Doc 6983.
        - Continuing the difficult discussion at the AWG TF meeting in Japan in December.
- New Business
    - SNARF: Revision of SEMI M73-1013E (Reapproved 1019): Test Method for Extracting Relevant Characteristics from Measured Wafer Edge Profiles, to include new metrics characterizing Edge Roundness
        - Frank Riedel presented the draft of the SNARF
            - Supika Mashiro stated the SNARF can't be submitted until the Patent Application number is known.
        - SNARF will be issued once the patent referred to is published
        - Will submit the related Letter of Intent to SEMI prior to issuing the SNARF

Attachment: AWG TF Europe Report_20231115 (1)

6.2 Int'l Automated Advanced Surface Inspection Task Force/ F. Riedel/F. Passek

6.2.1 Frank reported. Of note:

- 5 Year Review
    - SEMI M35-1114 (Reapproved 1019): Guide for Developing Specifications for Silicon Wafer Surface Features Detected by Automated Inspection
        - Kurt Haller will take a closer look to SEMI M35 contents and provide a recommendation on how to proceed at SEMI Standards NA Spring meeting in March 2024
- Old Business – Published Documents
    - Doc 6957 M52: Guide for Specifying Scanning Surface Inspection Systems for Silicon Wafers for the 130 nm to 5 nm Technology Generations
    - Doc 6984 M50: Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method
    - Doc 6988 MF1048: Test Method for Measuring the Reflective Total Integrated Scatter
    - Doc 6989 M40: Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers
    - Doc 6990 ME1392: Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
- New Business
    - Status of AFM Roughness Working Group Activities
        - WG leader Judith Wittmann (Siltronic AG) compiled the current status
    - Status of Haze Working Group Activities
        - WG leader Kurt Haller (KLA) gave a verbal summary on the current status

Attachment: IASI TF Europe Report_20231115

6.3 *Int'l Test Methods TF/ P. Wagner*

6.3.1 Peter reported. Of note:

- Review of Recent SEMI Japan Activities
    - Currently JSNM has three topics

    - Test Method for low carbon content in Si using low temperature FTIR:
        - plan for Japan industrial standard, registered to JISC, issued early in 2024 if no objection
    - Test Method for low carbon content in Si using low temperature photoluminescence:
        - plan for Japan industrial standard, registered to JISC, issued early in 2024 if no objection
    - Test Method for epi resistivity using hard metal contact CV profiling method:
        - standard needed for historical reasons
        - issued as JSNM standard in parallel with round robin and verification test

- SEMI Working Group – Phase Out of Mercury, A. Kempf, Siltronic AG
    - Mercury is a poisonous element and was internationally banned after the Minamata incident in 1953.
    - Mercury is used in the standard technique HgCV to determine the epi resistivity (SEMI MF 1392).
    - Main methods suggested: Non-contact CV (ACV), AC-SPV (SCP).
        - Focus will be on SCP (Surface Charge Profiling) method as a first step. The SNARF was presented.
            - **Motion:** Approve the SNARF for New Standard: Test method for epi-resistivity determination in Si wafers by Surface Charge Profiling
By: Frank Riedel / Siltronic AG
Second: Maria Cristina Sanna / GlobalWafers Company
Discussion:
Result: 8-Y 0-N Voting Result: Pass - 100.00%.
    - Working Group Participants: Global Wafers, JSNM, SEH, Semilab, Siltronic, Sumco.
    - Working Group kick-off meeting in May 2023

- A New Metric for Wafer Flatness: Edge Roundness, Th. Hager, Siltronic AG
    - Current parameters for specifying wafer edge shape according to SEMI M73 do not address the transition region between inner surface of wafer and its edge.
    - This transition region appears to be relevant for the yield in device manufacturing.
    - Siltronic has filed a patent for edge roundness characterization, based on two parameters:
        - radius
        - angle
    - These parameters can be used for optimizing the wafer edge shape for later process steps od wafer customers.
    - The target is to develop an industry-aligned standard for the metric „edge roundness“, which can be measured by existing edge profile measuring equipment.
    - Siltronic will prepare a SNARF for revising SEMI M73 by including the metric “edge roundness“, under the Int. Advanced Wafer Geometry TF in the future.

- Peter also reported that he would like to step down from the leadership and nominate Thomas Hager (Siltronic) to succeed.
    - **Motion:** Peter steps down from the Int'l Test Methods TF leader, and appoints Thomas Hager (Siltronic) as the new leader of the TF
By: Frank Riedel / Siltronic AG
Second: Bert Planting / ASML Netherlands BV
Discussion:
Result: 9-Y 0-N Voting Result: Pass - 100.00%.

Attachment: **Meeting minutes Nov 23**

Attachment: **SNARF SCP finalrev1**

6.4 *Int'l Polished Wafer TF/ F. Riedel*

6.4.1 Frank reported. Of note:

- 5 year review
  - SEMI M1-0918 Specification For Polished Single Crystal Silicon Wafers
- New Business
  - Doc 7024 - Line item revision to SEMI M1-0918 Specification for Polished Single Crystal Silicon Wafers: Diameter tolerance for 300 mm wafers
  - Result of industry-wide survey on reducing current 300 mm tolerance specification.
    - 24 responses: a clear majority in favor of 300.00 ± 0.1 mm mainly due to capability reasons
- Action
  - Issue line item revision of SEMI M1 on diameter tolerance 300.00 ± 0.10 mm for balloting as soon as possible
    - **Motion:** Authorize Doc 7024 - Line item revision to SEMI M1-0918 Specification for Polished Single Crystal Silicon Wafers: Diameter tolerance for 300 mm wafers, for letter ballot for review at SEMICON West
      By: Frank Riedel / Siltronic AG
      Second: Bert Planting / ASML Netherlands BV
      Discussion:
      Result: 9-Y 0-N Voting Result: Pass - 100.00%.
  - Discuss revising SEMI M1 and other standard documents with respect to removing 450 mm wafer specifications at TF meetings on occasion of Semicon Japan in December 2023

Attachment: **IPW TF Europe Report_20231115**

7 Old Business

7.1 None

8 New Business

8.1 None

9 Next Meeting and Adjournment

9.1 The next meeting is scheduled in conjunction with SEMICON Europa in November 2024. Refer http://www.semi.org/standards for the current list of meeting schedules.

9.2 Having no further business, a motion was made to adjourn. Adjournment was at 10:30 AM.

Respectfully submitted by:

Kevin Nguyen,
SEMI Standards Operations Manager
Phone: 408-943-7997
Email: knguyen@semi.org

Minutes approved by:

Peter Wagner (Self)	<Date approved>
	<Date approved>

Table 13 Index of Available Attachments[#1]

Title	*Title*
NA Si Wafer TC Chapter Liaison Report July2023	IASI TF Europe Report_20231115
202310_Silicon Wafer_JA_Liaison R0.1	Meeting minutes Nov 23
Staff Report Nov 2023 v3	SNARF SCP finalrev1
AWG TF Europe Report_20231115 (1)	IPW TF Europe Report_20231115

#1 Due to file size and delivery issues, attachments must be downloaded separately. A .zip file containing all attachments for these minutes is available at www.semi.org. For additional information or to obtain individual attachments, please contact [SEMI Staff Name] at the contact information above.